

Gestational age may impact academic performance

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A new study published in the *International Journal of Epidemiology* indicates that being born either too early or too late may have a long-term effect on children's academic performance.

The risk of cognitive and developmental problems in premature infants is well-established, but preventing preterm birth is limited clinically. By contrast, less is known about what happens to cognitive performance in children born post-term, or about the influence of birth weight variations within post-term populations, where there may be more scope for intervention.

This study details the relationship between gestational age at birth and school grades at age 16 across the full range of pregnancy duration (22 to 45 completed weeks), by weight-for-gestational age, focusing on extremely pre- and post-term births and taking account of possible effects within and between families.

Using the whole Swedish population, over 2 million live births between 1973 and 1994 were linked to the National School Register and other registers from Statistics Sweden and the National Board of Health and Welfare. Academic performance was measured by the final grade achieved on completing secondary education at 16.

Between 1973 and 1994, 9.4% of Swedish births were post-term and 4.6% preterm. Late preterm children (3.6%) were more likely to have been exposed to maternal medical risk or birth complications.

Grade averages were lower for pre- and post-term children than for term-counterparts, and were lowest in children showing evidence of poor fetal growth, irrespective of gestational age. The adjusted grades of extremely preterm children (at 24 completed weeks) were lower by 0.43 standard deviations (95% confidence interval 0.38 to 0.49) corresponding with a 21 point reduction (19 to 24) on a 240-point scale, although they had improved over time. The grades of extremely post-term children (at 45 completed weeks) were lower by 0.15 SD (0.13 to 0.17), corresponding with an 8 point reduction (7 to 9). Grades of pre- and post-term children remained lower than those of term counterparts when considering spontaneous deliveries, uncomplicated unassisted deliveries, children with normal Apgar, or without congenital anomalies. However, induced post-term deliveries were not associated with reduced school performance.

Among matched siblings, within-family effects were weaker, particularly in the preterm sibling cohort and less so in post-term children. This attenuation of effect suggests confounding by unmeasured familial traits. Residual within-family associations suggested there may also be direct causal links between birth at early or late GA and school-leaving age [academic performance](#).

This is the first study to detail associations between pregnancy duration and school performance across the full range of pregnancy. Irrespective of gestational age at birth, there was an independent effect of fetal growth restriction on later school performance which has persisted over time. There may be shared familial traits which influence risk of birth at non-optimal [gestational age](#) and also affect the academic performance of those born early or late. These may include modifiable risk factors such as poor maternal diet, smoking during pregnancy, and maternal obesity.

"Less favorable outcomes of post-term infants with poor fetal growth suggest that placental insufficiency may become particularly toxic to

neurodevelopment the longer a pregnancy endures," said lead author Dr Hein Heuvelman.

More information: Kathryn Abel et al. Gestational age at birth and academic performance: population-based cohort study, *International Journal of Epidemiology* (2016). [DOI: 10.1093/ije/dyw284](https://doi.org/10.1093/ije/dyw284)

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